

## Holiday lights: LED and fiber optics

**D**ecorating with holiday lights is becoming more of a year-round activity. As more lighting is used and as energy rates climb, consumers find that decorating with lights is costing more. Most people currently use standard incandescent C7 lights or mini-lights.

There are better ways! Light-emitting diode lights and fiber optic trees are two energy-efficient technologies that can reduce your energy costs—particularly when the lights are used for long periods of time, such as in commercial settings.

### LED lights

LED holiday lights are a new application for a mature technology. Each year manufacturers have improved the choices, producing bigger and brighter bulbs and new color options. LED lights have a number of benefits over conventional lighting:

- **Energy-efficient**—0.08 watts per LED C7 multicolor bulb (compared with 0.48 watts for an incandescent mini-light and 6.0 watts for a standard incandescent C7 bulb).
- **Long lifespan**—up to 50,000 hours or more used outdoors, and twice as long indoors. Some manufacturers provide a limited lifetime warranty.
- **Safety**—no chance of combustion, since the bulbs are cool to the touch, regardless of how long they are left on.
- **Sturdy bulbs**—the epoxy lenses are virtually indestructible.



These lights have a different appearance from familiar incandescent models, appearing to shimmer with movement as the light passes through the faceted

bulbs. LED bulbs do not emit the same amount of light as incandescent lamps, although some new models on the market are closer to the brightness of incandescent. In spite of the differences, LED lights can be used for beautiful and affordable holiday decorating.

LED lights are currently available in strings from 25 to 150 bulbs with red, green, blue, white, yellow and multi-colored bulbs. The strings come in many styles, including mini-ice, ball-shaped and candle-shaped C7 and C9 bulbs. Amber or orange Halloween lights and patriotic red, white and blue sets



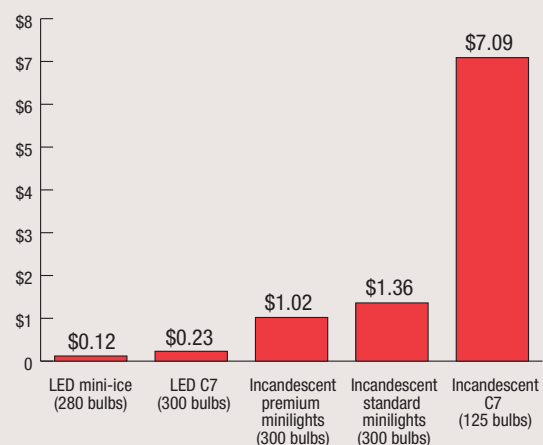
Photo courtesy of Kellogg Plastics.

are also available. Costs can vary widely by color because, unlike painted bulbs, the chemical makeup of the bulb produces the color. White and blue are the most costly.

Products include icicle-style lamps, strings that change from one color to another, rope lights, additional holiday ornaments and strings with commercial-quality plugs that allow more than 100 strings to be connected. At least one company is offering screw-in LED bulbs for converting your incandescent strings. ⚡

**Many Americans love to decorate with strings of lights during the holidays, most of which are standard incandescent C7 lights or mini-lights. LED lights and fiber optic trees are two energy-efficient alternatives to consider.**

**Figure 1**  
Energy cost\* of comparable options



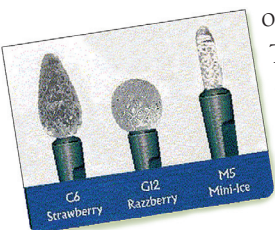
\*Assuming:

- An 8-foot tree lighted for one season (five hours per day for 30 days).
- Fewer standard incandescent bulbs in the display, because they are much brighter than LED bulbs.
- Wattages: LED mini-ice 280 bulbs = 13 watts;  
LED C7 multicolor 300 bulbs = 24 watts;  
incandescent premium (energy-saving) 300 mini-lights = 108 watts;  
incandescent standard 300 mini-lights = 144 watts;  
incandescent C7 125 bulbs = 750 watts (6 watts per bulb).
- Energy cost calculated at 6.3 cents per kWh.

## Fiber optic artificial trees

**A**nother relatively energy-efficient decorating strategy is the fiber optic artificial tree. Other decorations use fiber optics, too, such as Santa or angel figures and wreaths.

The trees use a single incandescent bulb ranging from five to 50 watts depending on the size of the tree, so there's only one bulb to replace.



The bulb transmits light through hundreds of very small fibers along each branch of the tree. Some trees come equipped with a rotating color wheel that changes the color the fibers emit.

Fiber optic lights are cool to the touch, since only light—not heat—is transmitted through the fiber. The incandescent light source is located in the base of the tree with ventilating holes that must not be covered. The trees cost from \$20 for a two- to three-foot model to more than \$200 for the largest trees. ⚡



## A note about wiring safety

**W**iring is a weak link in any system. Improperly attaching light sets with staples, winding wires around nails and other practices can damage wiring, as can prolonged exposure to sunlight. Treat the wiring with care to extend the life of any light set and increase safety.

Before putting up your lights, test the system and inspect the wires for defects. Many light set manufacturers now include a warning on product packaging regarding lead in the wire coatings. The coatings are the same on all wiring, but the wires of today are no different in this respect than the unlabeled ones of the past. It is recommended that you wash your hands after handling light sets. ⚡

**Timers that reliably turn off lights during daylight hours and other times can further reduce energy costs.**

## More holiday lighting information

For news and resources: [www.energystar.gov/index.cfm?c=dls.pr\\_dls](http://www.energystar.gov/index.cfm?c=dls.pr_dls)

### On-line resalers:

Brite-lite Wholesale Lighting Distributors—[www.brite-lite.com/Products/LEDchristmas.htm](http://www.brite-lite.com/Products/LEDchristmas.htm)

Forever Bright: "Where to Buy" lists stores that carry their LED strings—[www.holidaycreations.com/?n=where](http://www.holidaycreations.com/?n=where)

Holiday Lights and Magic—[www.holidaylightsandmagic.com/](http://www.holidaylightsandmagic.com/)

Kellogg Plastics Ltd, Inc. (Idaho)—[www.kelloggplastics.com/](http://www.kelloggplastics.com/)

LEDUp Enterprise Inc. (California)—[www.ledup.com/](http://www.ledup.com/)

Light Waves Concept Inc—[www.lightwavesconcept.com/home.php?cat=750](http://www.lightwavesconcept.com/home.php?cat=750)

Real Goods LED holiday lights—[www.realgoods.com/product/home-outdoor/lighting/specialty+lighting/multi-colored+led+holiday+lights.do](http://www.realgoods.com/product/home-outdoor/lighting/specialty+lighting/multi-colored+led+holiday+lights.do)

Sival, Inc.: Strings of red LED lights (California)—[www.sivalinc.com/](http://www.sivalinc.com/)